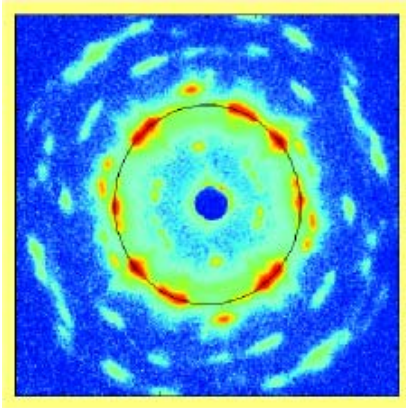
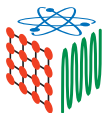


Making Ceramics More Useful



- For the first time, ceramic nano-dots, nano-wires, nano-sheets, nano-networks and nano-channels can all be synthesized by the same process.
- The process utilizes special polymers, called *block co-polymers*, whose dimensions can be controlled by changing the length of the polymer.
- Such nano-structured polymers may be useful as filters or to provide flexibility to normally brittle ceramics, to name a few possibilities.
- This work was performed as part of the Cornell Center for Materials Research, by the research groups led by Cornell University Profs. U. Wiesner and S. Gruner.

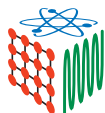


Programas Educativos



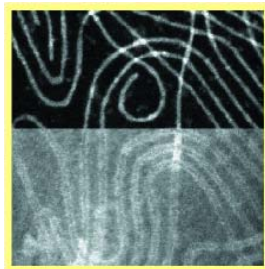
Photo by Nevjinder Singhoti, CCMR

- Professor Héctor Abruña, a member of the Cornell Center for Materials Research, explores the nature of chemical reactions using cornstarch and water with children in the *Esperanza* program in Ithaca, NY.

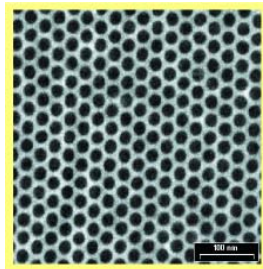


Improving Ceramics

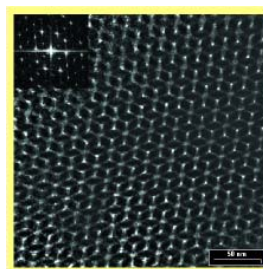
- One part of the co-polymer attracts ceramic precursor molecules and allows them to conform to the particular co-polymer structure. Figure 1 shows ceramic nanowires (white lines), Figure 2 ceramic channels (black circles), while Figure 3 shows a nano-network (connected white lines) called the “plumber’s nightmare”. An artist’s rendition of this newly discovered network is shown in a magnified view in Figure 4. Finally, Figure 5 shows an X-ray diffraction pattern of the plumber’s nightmare, which confirms its formation.



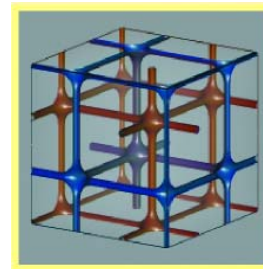
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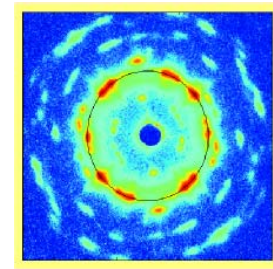
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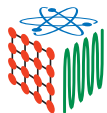
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4



5



Programas Educativos



Photo by Nevjinder Singhota, CCMR

- *Esperanza* is an after school program for Latino elementary school students in the Ithaca City School District. CCMR provides lessons in Spanish.
- Faculty and graduates students have presented the following hands-on lessons: *Wild Solutions*, *Marvelous Magnets*, and *States of Matter*.

